

MASS.
WRA1.2:
G47/2

HERST



2066016831573



**G.L.C. 30 SECTION 61 REVISED FINAL FINDINGS
BY THE MASSACHUSETTS WATER RESOURCES AUTHORITY
ON THE SECONDARY TREATMENT FACILITIES PLAN/EIR
FOR BOSTON HARBOR**

EOEA FILE NUMBER 6136

SUBMITTED BY:

MASSACHUSETTS WATER RESOURCES AUTHORITY
100 FIRST AVENUE
CHARLESTOWN NAVY YARD
BOSTON, MA 02129
(617) 242-6000

OCTOBER 15, 1990

WRA 1.2: G-47/2

UMASS/AMHERST



312066016831573



**G.L.C. 30 SECTION 61 REVISED FINAL FINDINGS
BY THE MASSACHUSETTS WATER RESOURCES AUTHORITY
ON THE SECONDARY TREATMENT FACILITIES PLAN/EIR
FOR BOSTON HARBOR**

EOEA FILE NUMBER 6136

SUBMITTED BY:

MASSACHUSETTS WATER RESOURCES AUTHORITY
100 FIRST AVENUE
CHARLESTOWN NAVY YARD
BOSTON, MA 02129
(617) 242-6000

OCTOBER 15, 1990

NOTICE TO REVIEWERS

Attached for your review is the Final Updated G.L.C. 30, Section 61 Findings on the Final Secondary Treatment Facilities Plan/Environmental Impact Report for Boston Harbor (EOEA File #6136). This document has been reviewed by the MWRA Board of Directors and approved for public review. This document will be noticed in the Massachusetts Environmental Policy Act (MEPA) Unit Environmental Monitor and comments should be forwarded to:

Ms. Janet McCabe
MEPA Unit
Executive Office of Environmental Affairs
100 Cambridge Street - 20th Floor
Boston, MA 02202

This document focuses upon the Secondary Treatment Facilities Plan/Environmental Impact Report for Boston Harbor and updates the Section 61 Findings published by the MWRA on December 15, 1988. The major difference between the earlier version and this document is the description of the effluent outfall. When the earlier version was produced, final design and precise location of the outfall were not yet determined. This document describes the final design and location of the outfall. In addition, descriptions of mitigation measures are updated and progress on mitigation is reported.

Thank you for your interest and we look forward to your comments.

Richard D. Fox
Director, Program Management Division, MWRA
October, 1990

**G.L.C. 30 SECTION 61 REVISED FINAL FINDINGS
BY THE MWRA ON THE FINAL
SECONDARY TREATMENT FACILITIES PLAN/EIR FOR
BOSTON HARBOR**

EOEA File Number 6136

Index

I.	Introduction.....	1
II.	Description of STFP/EIR Major & Complicated Process.....	2
III.	Commitments to Mitigation.....	5
1.	Section 61 Findings by the MWRA on the Selection of Deer Island as the Site for Wastewater Treatment Facilities for Boston Harbor: Status Update.....	5
	A. Flow & Growth (I/I Management Plan).....	5
	B. Commitments to Operation & Maintenance.....	8
	C. Odor Control.....	10
	D. Noise Control.....	12
	E. Barging and Busing.....	13
	F. Trucking of Liquid Chlorine.....	13
	G. Relocation of D.I. House of Correction.....	14
	H. Further Measures.....	14
2.	Final Secondary Wastewater Treatment Facilities Plan (May 1988).....	15
	I. Commitments on the Effluent Outfall and Water Quality.....	15
	J. Commitments on the Pilot Plant	19
	K. Commitments on Source Control.....	20
	L. Status of On-Island Residuals Treatment.....	25
	M. Accelerated Construction.....	25
	N. Commitments on Hazardous Materials and Waste Disposal.....	26
	O. Utility Supply.....	28
IV.	Summary of Impacts and Findings of Limitation of Impacts.....	28



Digitized by the Internet Archive
in 2015

<https://archive.org/details/glc30section61re00mass>

G.L.C 30 SECTION 61 REVISED FINAL FINDINGS BY THE MWRA ON THE FINAL SECONDARY TREATMENT FACILITIES PLAN/EIR FOR BOSTON HARBOR

I. Introduction

In May 1988, the MWRA completed the facilities planning and environmental review process for the new primary and secondary wastewater treatment facilities to be located on Deer Island, the inter-island tunnel, and the effluent outfall. Eight volumes and numerous appendices comprise the facilities plan and environmental impact reports. These reports document the analyses and decision process followed during the two year planning effort used to select the wastewater treatment processes and the location of the outfall tunnel alignment and diffuser, and to evaluate the environmental impacts of these facilities. Since May 1988, MWRA has received and evaluated comments on the Final Environmental Impact Report (FEIR) including the Secretary's Certificate of Adequacy, and has reviewed the Environmental Protection Agency's Draft and Final Supplemental Environmental Impact Statement on the Wastewater Conveyance System. Based on this information, the MWRA has completed the planning process for these facilities and has commenced design.

A draft of this document was published in December 1988. Comments received on the draft have been addressed in this revised final version. Additionally, progress to date on mitigation commitments has been described.

This document responds to the requirements of the Secretary's May 18, 1988 Certificate of Adequacy from the Executive Office of Environmental Affairs in that it:

- restates and updates the commitments to mitigation made in the Section 61 Findings on the Selection of Deer Island as the Site for Wastewater Treatment Facilities in Boston Harbor;
- describes the commitments to mitigation made by the Authority for each of the issues raised in the May 1988 Certificate; and
- addresses any changes necessitated by the EPA Draft and Final EIS on the Wastewater Conveyance System and Outfalls.

II. Description of Secondary Treatment Facilities Plan and EIR Major & Complicated Process

The Secondary Treatment Facilities Plan (STFP) and Environmental Impact Report (EIR) evaluated the facilities needed to provide primary and secondary treatment of the wastewater conveyed through the Massachusetts Water Resources Authority's North and South sewerage collection systems. Treatment is to be provided at a single wastewater treatment facility to be constructed on Deer Island. The STFP also evaluated the tunnels and support facilities needed to convey the South System flows from the existing Nut Island Plant to Deer Island, and the outfall facilities needed to convey the treated effluent from Deer Island to a disposal point in marine waters.

The need for upgraded and expanded treatment facilities to serve the Boston metropolitan area is clear because:

- present discharges place a significant burden on Boston Harbor, one of the area's vital natural resources;
- the existing treatment facilities have long exceeded their useful lives and do not reflect present day technology and design;
- federal and state statutes require enhanced levels of treatment;
- the Federal Court has intervened and ordered an upgrading of the treatment facilities.

The STFP and EIR provide the foundation for the Massachusetts Water Resources Authority's program for the design, construction and operation of new primary and secondary wastewater treatment facilities at Deer Island. This planning has been approached with the understanding that the facilities planning effort must secure and sustain the acceptance and support of the diverse community, government and business interests that it affects. Therefore, the planning process was based not on technical strength alone, but also on the continual reconciliation of political, legal, environmental, economic and community interests.

On February 3, 1986, the MWRA made its final selection of a site for the proposed secondary wastewater treatment plant. The selection of Deer Island as the location for the new facility brought to a close eight years of evaluation, discussion, comment and refinement of siting issues. Most of the history of the process, and information explored, is contained in the Supplemental Draft Environmental Impact Statement/Draft Environmental Impact Report (SDEIS/DEIR) and the MWRA's November 1985 Final Environmental Impact Report on the Siting of Wastewater Treatment Facilities in Boston Harbor (FEIR).

To expedite the planning and review process, the facilities planning for secondary treatment has received a designation as a "major and complicated" project under the Massachusetts Environmental Policy Act (MEPA) regulations. The "major and complicated" project designation permits the environmental reviews to be concurrent with, and an integral part of, the facilities planning process. Thus, the documents being prepared to summarize the facilities planning are the same documents which are used for environmental reviews.

The planning period used in this facilities plan encompasses the period from 1986 through the year 2020. This represents the first twenty years of operation of the secondary plant, which has been stipulated by the Federal Court to be in operation no later than the end of 1999. The STFP document is divided into eight volumes.

Volume I	Executive Summary
Volume II	Facilities Planning Background
Volume III	Treatment Plant
Volume IV	Inter-Island Conveyance System
Volume V	Effluent Outfall
Volume VI	Early Site Preparation
Volume VII	Institutional Considerations
Volume VIII	Public Participation and Responsiveness Summary

Volume II, Facilities Planning Background, describes the need for the project and the planning approach. It summarizes previous studies for the cleanup of Boston Harbor and other harbor-related projects. It also outlines the decision making process in the siting of the new facilities, and the court-ordered dates for implementation of the Facilities Plan.

The planning period and the service area for the facilities, projected wastewater flows and loads, and criteria used to evaluate all of the possible treatment processes in order to determine the most feasible, effective methods of treatment are also described in Volume II. The existing treatment facilities, environments, and regulations were also examined in Volume II, as are the environmental regulations that will affect the construction of the planned facilities. The facilities needed to provide wastewater treatment include the following: new primary and secondary treatment facilities located on Deer Island, preliminary treatment facilities at Nut Island; a new conduit to convey the South System wastewater from Nut Island to Deer Island (inter-island conveyance facilities); and a new outfall to discharge the treated effluent into the ocean.

The initial implementation phase of the treatment plant construction program is called early site preparation. Early site preparation includes the construction activity which prepares the topography of Deer Island for facilities construction. The planning for the facilities needed to provide secondary treatment and the early site preparation project is presented in four, stand-alone volumes:

Treatment Plant, Volume III
Inter-Island Conveyance System, Volume IV
Effluent Outfall, Volume V
Early Site Preparation, Volume VI

Volume VII, Institutional Considerations, identifies the permitting, program management, financing, human resources and regulatory requirements for constructing and operating the recommended facilities within the schedule required by the Federal Court. The analysis includes a review of the court-ordered target dates and recommends the changes in the schedule that are deemed necessary.

Volume VIII, Public Participation and Responsiveness Summary, includes all comments and responses received on the draft documents as well as a summary of the Public Participation Program.

As part of the Secondary Treatment Facilities Plan development, major decisions were made to select a wastewater treatment process; to size and locate conduits and pumping stations to convey the wastewater and treated effluent to and from the Deer Island Treatment Facility; and to plan the initial site preparation program at Deer Island.

In evaluating the various alternatives, four broad categories of criteria were established:

- Environmental - which focused on air emissions, noise traffic and marine resources, and measured the potential environmental impacts of each alternative.
- Technical - which focused on engineering issues, such as reliability, flexibility, constructibility, operational complexity, area requirements, staffing requirements, and power needs.
- Cost - which presented the financial investment necessary to construct and operate the various alternatives.
- Institutional - which assessed the differences among alternatives according to the time required for construction and the coordination required among a wide variety of public and private organizations and agencies.

These criteria were used to select the recommended plan, which provides the most technically and environmentally sound, cost-effective and implementable alternative.

III. Commitments to Mitigation

1. Section 61 Findings by the MWRA on the Selection of Deer Island as the Site for Wastewater Treatment Facilities for Boston Harbor: Status Update.

The Section 61 findings resulting from the 1985 Final Environmental Impact Report on Siting of Wastewater Treatment Facilities for Boston Harbor included a series of commitments to mitigation. The MWRA has initiated many programs to establish the systems and procedures to achieve the commitments made in the Sighting Decision and the Secondary Treatment Facilities Plan. A summary of each mitigation commitment or the actual text (in ""), and progress in meeting those commitments follows.

A. Flow and Growth

"Recognizing the need for responsible management and being sensitive to the possible need for expansion of the new treatment plant, the MWRA made the following commitment with respect to flow and growth:

- o The MWRA will undertake all necessary and prudent planning and management initiatives to avoid overloading the Harbor Islands treatment plant.
- o The MWRA will not expand the treatment plant capacity unless or until it has implemented flow management techniques and has developed and implemented a program to avoid excess pollutant loading. These techniques and programs include:
 - Conducting infiltration/inflow reduction programs
 - Instituting water conservation programs that can reduce wastewater flows
 - Pricing of water and sewer services to promote the conservation of water, thus reducing wastewater flows
 - Controlling pollutant loads through pricing strategies and pretreatment programs
 - Controlling both flow and loads through regulatory controls, such as flow reduction programs to compensate for new connections

- Developing monitoring and triggering programs to test the effectiveness of the flow management techniques and to provide the MWRA with the ability to determine when planning for the MWRA's next increment of treatment capacity should be undertaken

If the MWRA determines, through its monitoring and triggering programs, that the flows and loading are increasing at rates higher than projected in the FEIR, it will take all necessary steps to plan, design and construct ancillary facilities including (but not limited to):

- Flow control structures, such as on-line and off-line storage to minimize peak flows at the plant
- Septage treatment facilities to reduce pollutant loadings on the Deer Island Plant

If the ancillary facilities are insufficient to accommodate increased flow and loading and to prevent exceeding the design capacity of the Deer Island treatment plant, the MWRA will take all necessary steps to plan, design and construct satellite treatment plants unless it determines it would be economically or environmentally infeasible to do so.

Notwithstanding the foregoing, the MWRA does not intend the adoption of the above commitments to require the postponement or cancellation of any capital program contained in the Authority's Fiscal Year 1986-88 capital budget that serves to eliminate an existing problem of sewage backups.

The purpose of these commitments is to confirm the MWRA's desire to establish a sound and rational program for assessing future capacity needs, to respond to public concerns on overloading and future system expansion, and to provide a framework within which additional capacity will be planned."

These commitments are further formalized in the Memorandum of Understanding (MOU) between the Town of Winthrop and the MWRA (February 2, 1988). Under the terms of that agreement, the Authority will not expand the new wastewater treatment facility size beyond the design flow and loading capacities presented in the Final Secondary Treatment Facilities Plan, and any additional treatment facilities required in the future, such as filtration units, will be contained on the plant side of the established berm and separation area. While the formal MOU has a specified life span, this commitment extends beyond that life span and is permanent.

In order to control the wastewater flows influent to the future plant, the MWRA has developed an Infiltration and Inflow (I/I) Management Plan. While I/I management is primarily the responsibility of the local communities, MWRA has taken the lead in developing a program for the entire sewer service area which will assist communities in identifying and

controlling I/I. The I/I Management Plan is discussed under item III.K herein.

The MWRA has implemented and continues to develop several water conservation programs that can reduce wastewater flows. These programs include: a pilot program to install water saving devices for residential customers; an intensive, local pilot public information campaign; a pilot program to install 2,500 water saving toilets in municipal facilities; a successful campaign to change the State Plumbing Code to require that essentially all toilets installed after March 1989 use only 1.6 gallons per flush (versus the previous standard of 3.5); and water conservation curricula for elementary and junior high school students.

The MWRA has also begun programs to shift pricing strategies to reflect the annual costs of services and encourage reduction of water use and wastewater flows. Communities in the service area have eliminated declining block rates for water services. The Authority plans to require contract water communities to pay fees that reflect the actual cost of the water and is establishing a technical assistance program to help the remaining communities in achieving that goal. The MWRA is also implementing a sewer metering program (see below) with the goal of establishing sewer billing to the communities based on actual flows and loads.

The MWRA continues to expand and strengthen its industrial pretreatment program and other programs to reduce pollutant loadings to the treatment plant. The pretreatment program is discussed in detail in section III.K. The Authority is working closely with communities in developing complete information and appropriate pricing strategies for pollutant loadings from large users in each community.

Programs to reduce flows and loads through regulatory controls are also being implemented. The Authority has strengthened sewer use regulations to prohibit unnecessary Inflow and Infiltration and is requiring towns to implement I/I reduction plans. The Authority is increasingly requiring developers to show reductions in I/I to offset increases in flows from proposed new connections.

The MWRA is developing a complete sewer monitoring and metering system to develop constant, comprehensive information on sewer flows. By the end of July 1990, 150 interim meters will be in place and sending information to a central computer. Following implementation of the interim meter phase, a permanent phase planning study will be performed based on preliminary information from the meter system. A permanent meter system will be in place by the end of 1993. Information from the metering program will be invaluable in monitoring the effectiveness of I/I control programs, implementing sewer rate charges, documenting pollutant loadings, and developing a triggering system for planning future wastewater treatment facilities.

B. Commitments to Operation and Maintenance

Several issues were covered in the original commitments to Operations and Maintenance. Each of the commitments is listed below in quotes (""), with the update following each commitment.

"MWRA has already made clear its commitment to improved operations and maintenance by approving both a substantially increased operating budget and by authorizing significant increases in operations and maintenance. This commitment is underscored by their adoption of the following assurances:

- o Review of Recurrent Budgets. Annual operating budgets will be carefully scrutinized to be certain that these budgets reflect not only a sound maintenance program for existing facilities, but that the budgets reflect any new facilities expected to be in service during the budget year. The MWRA will link budget expenditures with performance indicators that reflect the efficiency and effectiveness of the maintenance programs."

Examples of such linkages include reduction of days the discharge is in violation of its permit or reduction in downtime of pumps due to unscheduled maintenance. The MWRA has increased Deer Island personnel 185% to 263 people, including 101 maintenance staff, and has increased expenditures for maintenance supplies and services 105% to \$1.4 million.

- o "Renewal/Replacement Expenditures. "More than \$100 million in construction projects have been initiated at the Nut Island and Deer Island treatment plants to replace much of the antiquated equipment at these plants. These upgraded programs are expected to be completed in 1990 and will contribute significantly to the reliability of the existing plant equipment. Capital budgets in future years will continue to reflect the important role that R/R plays in the maintenance of treatment facilities. The MWRA maintenance procedures will be modified at an early date to incorporate record keeping procedures that will provide a rational basis for R/R investment in future years."

Fast-track upgrade programs have included improvements in the sedimentation basis, remote headworks, pumping and power facilities and sludge thickeners and digesters. The Authority is now anticipating the initiation of the interim track (1990-1994) improvements on Deer Island including: sodium hypochlorite disinfection (under construction), gas burner and stack silencer replacement, new personnel facilities and interim residuals (under construction).

- o "Review of Maintenance Procedures. Prior to the completion of the ongoing upgrade program, the MWRA will initiate a review

of its existing maintenance procedures. Strengthened maintenance procedures will be designed including an aggressive housekeeping and preventive maintenance program. The procedures will be amended as new treatment facilities are constructed."

The MWRA is developing an interim MIS Maintenance System to improve Scheduling, Tracking and Preventive Maintenance.

- o "Initiate Early Planning. To ensure that operations and maintenance considerations are included as an integral part of the planning for all new facilities, the MWRA has prepared a Plan of Operations. The plan of operations is a working document which identifies the additional or unique O & M requirements of the recommended facilities, such as staffing, special training needs, O & M manuals, maintenance management, process control, computerized systems, start-up planning and estimated budget considerations. Based upon the Plan of Operations, task committees are being formed in 1990 to implement the plan. This Plan of Operations will provide the MWRA with two to four years' lead time prior to completion of facilities to incorporate the maintenance requirements of new facilities into ongoing maintenance programs."
- o "Adoption of Performance Indicators. The MWRA will adopt performance indicators into the agency's proposed management information systems that will permit the Authority to review on a regular basis the level-of-effort and the performance of the maintenance activities. Indicators such as plant performance, equipment availability, maintenance labor/expenditures, custodial inspection reports, spare parts inventory, and equipment age will be monitored to regularly examine the efficiency of the maintenance programs to provide focus on issues of local importance.
- o A four (4) phased long range training program has been initiated in 1990 consisting of 1) O & M skills orientation/career counseling, 2) basic skills training, 3) craft skills training, and 4) plant specific equipment skills training. The programs for Phases I and II are being planned and developed in 1990. Formal training will begin in January 1991.

Preliminary plans were included in the STFP EIR/EID for the "Maintenance of Plant Operations During Construction" and for operations and maintenance requirements such as staffing, special training needs and budget considerations.

Since completion of the EIR in mid-1988, the operation and maintenance mitigation requirements have been incorporated into the scope of work for the Program/Construction Management (P/CM) team, Kaiser Engineers, Inc. Kaiser Engineers' contract provides for production of consistent design standards which promote efficiently operating facilities. In conjunction with the Lead Design Engineers (LDE), Metcalf & Eddy, Inc., the O&M design standards were completed in September 1989 and incorporated into the Project Design Standards being used by all designers. In addition, an O&M Design/Construction Review Committee has been in operation since February 1989 to ensure O&M concerns are addressed by designs.

Detailed plans are continually being updated for long and short term operations and maintenance of the existing and the new facilities. The preliminary O&M plan was approved by the Board on April 25, 1990.

In addition, during 1988 the Authority implemented a new Performance Management Review System (PMRS) for non-union employees, that will improve overall agency performance, including plant operation.

C. Odor Control

The MWRA originally committed "to the construction of a treatment plant that will control odors so as to eliminate detectable odors off site and to minimize, to the maximum extent feasible, objectionable odors on-site. The type of odor control needed will be selected during the facilities planning effort. Sampling of the odor potential characteristics of the influent wastewater will be conducted as part of the facilities planning to provide necessary data to develop a program of source control and to size and select the odor control equipment."

The MWRA also committed to establishment of an odor panel "to routinely monitor for odor to ensure that no objectionable odors are occurring off-site. The panel will also respond to odor complaints received by the plant, by assisting in the investigation of the odor and recommending odor control techniques."

In the February 1988 MOU with Winthrop, the MWRA agreed to construct and operate the facility to control odors so as to eliminate detectable odors off-site and to control atmospheric emissions as necessary to protect the public health. During the design of the treatment plant, which began in August 1988, the odor control facilities will be specified. It is the responsibility of the Authority's Mitigation Agreements Compliance Manager, to track the design process to ensure that the odor control components of the design meet the odor control commitments.

During the summer of 1988, the MWRA conducted an Odor Monitoring Project at Deer Island. TRC Environmental Consultants, Inc. identified sources of odors such as digester gas, flaring operations, aerated influent channels, primary sedimentation tanks and diesel engines. Results of this

study, including modeling data, can be utilized in future odor control planning.

Mitigation measures proposed in the Final STFP, and now incorporated as commitments into the plant design and early site preparation include:

- locating treatment operations having a high potential for odor production in the southern portion of Deer Island; the residuals area and the preliminary treatment area, which has the greatest potential for odors, is located at the southern end of Deer Island;
- excavation and disposal of the majority of the grit and screenings during the cooler months; should some of this excavation be required to take place during warmer months, special odor control procedures will be implemented;
- covering a grit chambers, primary clarifiers, and aeration tanks, as well as the treatment of off-gases to remove both odors and volatiles organic compounds; utilize a two-stage treatment system, consisting of wet scrubbing and carbon absorption for controlling air emissions.

The Lead Design Engineer (LDE) and all Project Design Engineers (PDEs or detailed designers) have been apprised of the Winthrop MOU and are required to address relevant features of the MOU in their designs. The LDE is responsible for ensuring that the provisions of all mitigation commitments are addressed in design documents.

During the first 18 months of the design phase (1989 - 1990), the following steps in the odor control aspects were undertaken:

- preliminary design of air handling systems to collect/deliver all off-gases from tunnel shafts, primary channels, primary clarifiers, grit chambers, aeration tanks and various residuals facilities to the air emission facilities (including NI facilities)
- preliminary sizing of air emission facilities - updating air volume figures from the Facilities Plan
- preliminary assessment of alternative air emission control technologies based on literature research and discussions with other metropolitan plants
- development of draft workplans to address the strategy to be followed during the final design/permitting process
- initiated discussions with State Division of Air Quality Control to review the permitting process

- initiated workplan development for orderly implementation of updated modeling, sampling and piloting activities for air emissions facilities

During 1990, odor and air emissions control pilot testing will be carried out for the treatment plant and headworks. The best achievable control technology analysis is required for licensing request and will be carried out. Results of the pilot testing will be used to finalize control design.

D. Noise Control

The MWRA committed to "complying with all the legal standards of both City of Boston noise control ordinances and the Department of Environmental Quality Engineering. Because of the scale of the proposed plant, however, the MWRA is setting as a goal noise abatement that goes beyond simply adhering to the City of Boston Code. The MWRA has attempted to define, by the FEIR, what noise levels may be achievable and will examine means of noise abatement throughout the planning, design, and operation of the facility.

The MWRA further commits to the development of a program for avoiding noise impacts, the components of which shall be resolved during facilities and construction planning, but which shall include the following:

- o The establishment of an Acoustical Review Board. The Acoustical Review Board will include representatives from the community as well as engineers and MWRA staff.
- o The use of available and feasible noise control techniques, which may include such items as the evaluation of the acoustical characteristics of operational equipment and flexible scheduling of construction activities to minimize noise.
- o The establishment of necessary training and hiring practices to assume the best possible control of noise impacts.
- o The involvement of the community in the development of noise control programs and the participation of community representatives in those programs."

The MOU between the MWRA and the Town of Winthrop specifies noise limits for day and night hours during construction and subsequent operation of the treatment facilities. The MOU also provides a mechanism for establishing noise levels for extended workday hours or working on Saturday morning if necessary to meet Court-mandated milestones.

The MWRA's Program/Construction Manager has developed methods to determine noise specifications and compliance and standard contract language for the construction of the facilities which will incorporate the noise standards from the mitigation agreement with Winthrop. Overall management and coordination of noise mitigation at the Deer Island construction site will be the responsibility of a full time site manager as part of the MWRA's Program/Construction Management Contract.

Discussions with the Town of Winthrop are ongoing regarding maintaining acceptable noise levels. A noise model of the Deer Island site has been developed as a management tool for insuring that the combination of construction activities taking place on the Island will not violate agreed-upon noise levels.

E. Barging and Busing

In the 1985 Section 61 Findings, the MWRA committed to barging and busing of traffic associated with construction of the new plant. Barging would be used for transport of construction materials and all workers would be bused to the site up to a maximum of 28 buses (round trips) per day. The MWRA agreed to investigate using ferries to transport workers to the construction site.

The MOU between the MWRA and Winthrop placed more stringent levels of mitigation on worker and material transport. The MWRA has agreed that, during pier construction, no concrete or aggregate for concrete will be trucked through Winthrop. Once the piers are complete, the MWRA will limit truck trips through Winthrop. MWRA has agreed that, once the piers and early site preparation phase of construction are complete, it will provide the capacity to ferry fifty percent of the construction workforce to the site. The remaining workforce will be bused.

The MWRA has awarded contracts for Water Transportation System operators to implement this aspect of the mitigation agreement. The Deer Island piers are completed. Materials will either be barged directly from suppliers or transported from roll-on/roll-off piers at the Fore River Staging Area in Quincy. Proposed sites for ferrying half the construction workers are: Squantum Point in Quincy, Beverly Street/No. Station, Rowes Wharf, and a site on the Mystic River. The remaining 50% of construction workers will be bused to Deer Island from a satellite bus facility at Suffolk Downs in Revere.

F. Commitment on Trucking of Liquid Chlorine (Interim Disinfection)

The MWRA committed "to cease the trucking of liquid chlorine through the streets of Winthrop as soon as possible upon access facilities becoming operable and the transport of alternate disinfectant or barging of liquid chlorine being feasible."

Under the terms of the mitigation agreement with Winthrop, trucking of liquid chlorine for disinfection will cease and sodium hypochlorite will be barged into the Deer Island piers and stored on-site. Design of interim sodium hypochlorite facilities was completed in August 1989 and the barging contract was awarded in November 1989. The facilities are currently being constructed. A six month construction period is anticipated. Elements of the interim disinfection equipment were designed for possible reuse as parts of the new treatment facilities.

G. Relocation of the Deer Island House of Correction

The MWRA "determined that the Deer Island House of Correction must be relocated from Deer Island by those parties with jurisdiction over its operation and that such relocation must be deemed a mandatory mitigation measure."

Massachusetts House Bill #5384 was passed by the state legislature and signed by Governor Dukakis in July 1988. The new law clears the way for construction of new prison facilities for Suffolk County and the decommissioning of the new Deer Island House of Correction. Decommissioning is scheduled for late 1991. The Commonwealth of Massachusetts as part of the Boston Harbor court action, is under Federal Court order to remove the prison by December 1991.

H. Further Measures

Additional suggestions by the Secretary in the original (1986) Certificate included:

- "1. The "Sewer Bank" concept be further explored and feasible programs developed to eliminate excess flow and accommodate new connections." [See Section III.2.K]
- "2. Accommodate major growth within the service area through satellite plants." [See Section III.2.K]
- "3. Continued and strengthened programs to monitor flows to provide sound data to gauge the effects of flow management." [See Section III.2.K]
- "4. Implement odor panel and formal odor complaint response at existing facility." [See Section III.1.C]
- "5. Consider real time monitoring of odors, perhaps using hydrogen sulfide as an indicator." [See Section III.1.C]

- "6. Consider development and implementation of a monitoring program for VOCs and other air toxics in the wastewater stream and in the ambient air." [See Section III.2.J. and K.]
- "7. Recommend implementation of an acoustic Review Board to monitor and respond to noise complaints at existing facility; and supplement such a noise program now and at the new treatment plant with periodic noise monitoring." [See Section III.1.D]

2. Final Secondary Wastewater Treatment Facilities Plan (May 1988)

The Certificate of Secretary of Environmental Affairs on the STFP indicated that several issues required further attention. Commitments regarding those issues are described below.

I. Commitments on the Effluent Outfall and Water Quality

The Secretary's Certificate directed that investigations should take place to determine if significant mitigation is available by use of an effluent discharge location beyond the one proposed in the STFP (Site 5).

A lengthy and complicated evaluation process took place to study impacts of the various proposed outfall sites. While the MWRA is confident that this process yielded a suitable outfall site, the MWRA also gathered additional information for consideration during final effluent outfall design. The MWRA's commitment to perform additional, ongoing study and analysis regarding the impacts of the outfall, and to retain some flexibility of outfall and diffuser design to allow new information to influence final design is described below. The process used to select the final outfall site is also summarized in a subsequent section.

1.0 Final Design of the Effluent Outfall

The MWRA has selected an area approximately 8.1 to 9.4 miles east-northeast of Deer Island as the location the effluent outfall diffuser. Concern has been voiced for not studying a discharge site farther offshore. In fact, sufficient evidence exists to conclude that more distant sites would not provide a dramatically greater measure of environmental protection. Measurements of temperature and salinity near Site 6 (a proposed more distant site), taken as part of an analysis of nutrients in Massachusetts Bay, show that this area is similar to the recommended diffuser area. Currents, salinity, and temperature were measured east of Site 6 by the U.S. Geological Survey around the same time as the MWRA field program gathered data nearer to shore. From the preliminary results of this program, it appears that the tidal and residual currents are of similar magnitude to those measured around the recommended diffuser location.

Future monitoring programs will provide further information to confirm or refute these results.

In making the decision about the outfall diffuser location, MWRA considered existing data and the results of its own oceanographic studies. The studies and criteria upon which the decision was based were developed with significant input from regulatory agencies, scientists, and citizens. MWRA is confident that the planned outfall tunnel and diffuser and the general location of the diffuser provide best combination of favorable conditions which can be reached with reasonable means.

Precise location of the diffuser structure within the area has been carried out during the final design phase. The location decision has been based upon the results of geophysical and geological investigations and detailed design of treatment facility hydraulics. Two seasons of successful test borings (56 total) and extensive geophysical surveys were performed during 1988 and 1989 to determine the optimum constructable horizontal and vertical alignments for the tunnel and diffuser system. Geophysical surveys included seismic reflection and refraction, bathymetry, magnetometer and side-scan sonar on close grid intervals along the proposed alignments. Two specific locations for siting of the diffuser were subjected to detailed investigations and analysis.

In addition, physical hydraulic model studies as suggested by EPA's Final Supplemental Environmental Impact Statement have been performed for effective dilution analysis and ability to purge saltwater from the tunnel and diffuser system. Results of the dilution model studies, conducted by the Georgia Institute of Technology at the EPA Fluid Modeling Facility in Research Triangle Park, North Carolina, indicate that 55 vertical risers spaced along a 6,600 foot long diffuser section will provide the dilution capability specified by the Facilities Plan. This has been approved by EPA, and the Assistant Secretary of Environmental Affairs found no increase in impacts (March 5, 1990). The Facilities Plan specified a total of 80 vertical risers. Reduction of the number of vertical riser/diffuser structures to be constructed represents a significant cost savings without sacrifice of the effective dilution of the dispersed treated effluent.

Physical criteria for site selection included 1) level bottom 2) high bedrock 3) good quality rock within the areas recommended by the facilities plan and the FEIS 4) minimum recent marine sediments. One tunnel alignment and two possible diffuser sites were identified for additional study in the 1989 detailed design phase. The 1989 marine geotechnical investigation resulted in concurrence of the tunnel alignment and selection of the option 1 diffuser site.

The diffuser as designed consists of 55 riser structures installed parallel to a 6600 ft length of tunnel located between lat. 42° 23' 03.2", long. 70° 48' 13.5" and lat. 42° 23' 19.6", and long 70° 46' 48.4". Each riser is capped with a 10.5 to 13 ft. diameter 8 port diffuser head which will protrude 8 to 14 ft. above the sea bottom. The diffuser heads will be surrounded by a mound of rock armor that will assist in deflecting anchors and anchor

chains as well as reduce or prevent scour of the sea floor. The diffuser caps are designed to survive direct impact of a dropping anchor and to minimize snagging of anchors, anchor chains, and fishing gear.

The diffuser structure is located within the area described in both the Secondary Treatment Facilities Plan and the Boston Harbor Wastewater Conveyance System Final Supplemental Environmental Impact Statement produced by the U.S. Environmental Protection Agency, Region I.

Additional information for subsequent diffuser performance evaluation will result from MWRA's Harbor Studies Program. MWRA has committed funds and personnel to continue to examine existing data on Boston Harbor and Massachusetts Bay and to initiate long term biological and chemical monitoring to describe existing conditions and evaluate the impacts of the treatment facility discharge. Monitoring will take place in locations throughout Massachusetts Bay including areas seaward of the diffuser location. Protocols for this monitoring are being developed in cooperation with concerned agencies and academic institutions including EPA, MEPA and the Massachusetts' Office of Coastal Zone Management. Final review of the monitoring program will be conducted by a subcommittee of the Massachusetts' Bays Program.

The first phase of the long term outfall monitoring has been initiated; scientists will measure the motion and deposition of sediment and will characterize the existing nutrient concentrations and phytoplankton populations along a transect centered on the outfall location throughout one full year.

2.0 Siting of Effluent Outfall

The effluent outfall consists of a deep rock effluent tunnel originating from a vertical shaft at Deer Island and terminating at a diffuser structure to be located in an area Massachusetts Bay between 8.1 and 9.4 miles east-northeast of Deer Island. The preliminary plan for the diffuser structure called for 80 vertical riser shafts connected to the effluent tunnel spaced along the final 6600 feet of the tunnel. As stated above, dilution model studies have indicated that the number of vertical riser shafts may be reduced to 55 without sacrifice to effective dilution. Therefore, a total of 55 vertical riser shafts spaced along the final 6,600 feet of the tunnel has been designed. The riser shafts will disperse treated effluent into the ocean environment through discharge ports along the ocean floor.

Determinations of effluent outfall design and location considered physical, chemical and biological oceanography, geology, construction methodology, schedule and cost. The effluent discharge area selected represents the most favorable mix of outfall site characteristics. It is well within the large-scale circulation patterns of Massachusetts Bay and therefore provides the most robust long-term mixing. It is an area of limited potential sediment accumulation and thereby avoids problems associated with concentrating pollutants in bottom sediments. It is located away from intensely utilized

near-shore resources, avoiding the potential for disruption. Finally, the location for the diffuser can be reached by a gravity flow effluent tunnel within a timeframe consistent with the spirit of the court-ordered target dates for treatment facilities construction.

The environmental impacts of constructing the effluent outfall will be minimal. The effluent tunnel will be bored through rock below the ocean floor with no effect on the marine environment. Impacts on tunnel boring will be limited to noise and traffic on Deer Island, and the possible need for disposal of tunnel wastes consisting of rock. These impacts will be effectively mitigated through the construction mitigation commitments (described in section 1 of this document) made by MWRA and the disposal or reuse of tunnel wastes using environmentally accepted methods.

The diffuser construction will entail a small degree of disruption of the benthic habitat; however, the impact will be short in duration and rapid recolonization of the area adjacent to each riser is expected. The diffuser structure will have minimal impacts on commercial activities such as bottom trawling. The area is not actively trawled by commercial fishermen, due to a lack of bottom conditions favoring trawling and conflicts with gear (e.g. lobster pots). Side scan sonar data collected in the outfall region by MWRA contractors and independently by the U.S. Geological Survey have been used to increase confidence that the final diffuser siting will not conflict with bottom trawl fisheries. The discharge of wastes through the diffuser during facility operation is expected to have minor impacts on the marine resources in the vicinity of the diffuser. Suspended solids contained in both the primary and secondary effluent discharged will settle. However, the amount of sediment buildup will be significantly less than tolerable levels. The potential for bioaccumulation of toxic materials in the sediments within the study area is considered to be small because of the dispersive nature of the environment, and thus would not adversely affect the benthic environment.

Many commentators questioned the methods and results of the oceanographic studies leading to the location of the outfall diffuser structure. The physical oceanographic studies performed for MWRA during the diffuser siting process demonstrate that the outfall diffuser is well within the offshore region where vigorous, variable currents will provide adequate dilution and transport. Field operations were used to calibrate and validate a numerical model of pollutant transport. The model was used by the MWRA to predict likely concentrations of contaminants in Massachusetts Bay resulting from the proposed discharge. Long term, continuous measurements of currents and sediment transport in the vicinity of the proposed outfall will be made to better determine regional currents and transport patterns over the year, as well as during storms. This joint MWRA/USGS study will be coordinated with current measurements conducted by the Massachusetts' Bays Program to determine regional current and transport patterns.

The model demonstrated that the recommended discharge would be sufficiently diluted to meet state water quality standards and most EPA

water quality criteria. With secondary treatment, 55 of 60 criteria are likely to be met.

The MWRA results were confirmed by EPA, as documented in the Final Supplemental Environmental Impact Statement on the Boston Harbor Wastewater Conveyance System. The EPA screening analysis, which included a site beyond the recommended area (Site 6), showed that no significant benefit could be gained by discharging at the more distant site.

The proposed discharge will yield considerable environmental benefit over the present situation, even without the improved treatment which will be provided by the new Deer Island treatment facilities. The initial dilution of effluent will be greatly increased, ten to twenty-fold, because of the greater depth of the outfall. Improvement can be expected throughout Massachusetts Bay. As an example, the effluent reaching Nahant from the proposed diffuser site will be nine times more dilute than the effluent reaching Nahant from the existing primary treatment facility outfall in President Roads.

J. Commitments on the Pilot Plant

The Secretary's Certificate pointed out the importance of pilot treatment plant operations to confirm the performance of planned treatment processes and better estimate environmental impacts. The Authority commits to conducting a pilot program that at a minimum, evaluates:

- effectiveness of critical aspects of the secondary treatment process including the anaerobic selector;
- partitioning of metals and priority pollutants into secondary effluent and sludge;
- sludge production rates;
- potential air emissions including odor impacts;
- hydraulic evaluation of stacked clarifiers.

The piloting for the wastewater treatment process involves two phases. The first phase, implemented beginning in late 1988, is a traditional pilot program that utilizes trailer mounted treatment units. This pilot program confirms the basic sizing, loading criteria and anticipated performance of the pure oxygen activated sludge system and the anaerobic selector. The data developed in late 1988-mid 1989 has been incorporated onto the conceptual design of the plant.

The interim (trailer mounted) pilot plant did not have mechanical surface aerators of the same type proposed for the full scale plant, thus direct correlation of air emissions data from the pilot plant with the future full scale facility may not be possible.

The second phase of the pilot program is to design and build two parallel pilot secondary treatment trains at the 1-2 mgd scale, to be incorporated into the full size plant as a permanent testing, training and research facility. This facility is currently in the design phase. Based on the current schedule, data from this pilot facility will not be available until February 1993. At that point the data generated will be used to confirm the detailed design of the secondary plant, and emissions control equipment. The permanent pilot plant will be able to physically model the stacked clarifiers, whereas the interim pilot plant could not. Hydraulic modeling of the stacked clarifier and inlet-outlet dynamics were undertaken in mid-1989, however.

K. Commitments on Source Control

1.0 Introduction

The Secretary's certificate emphasized the importance of reducing infiltration and inflow and toxics in the wastewater stream.

It is the commitment of the MWRA, to the extent practicable and through means legally available to the Authority, to minimize the wastewater flows and waste loads (both organic and toxic) input to the new treatment facilities. The MWRA has initiated and is committed to continuing aggressive programs that address both the controls of flows (Infiltration/Inflow Management Program) and control of loads (Toxics Control and Reduction Program).

2.0 Infiltration/Inflow (I/I) Management Program

In April 1988, the MWRA Board of Directors adopted a Preliminary I/I Management Program Plan. The preliminary plan addressed those elements described below.

The system conveying wastewater to the new treatment facilities consists of more than 5000 miles of pipes. The vast majority of the pipes are owned by the communities served, with some 230 miles of pipes owned by MWRA. Water leaking from the ground into these pipes greatly increases the volume of wastewater requiring treatment.

Control of the leakage of clean water (infiltration/inflow) into the sewer system is the responsibility of the MWRA, DEP, and the MWRA sewer service area member communities. As part of the I/I program MWRA is developing a long-term policy which states that no excessive I/I be allowed to enter the MWRA sewer system or its tributary systems. The policy will list the management approach which the MWRA will use to meet this objective and the responsibilities of the communities.

The policy is being developed in conjunction with an interagency agreement with DEP which will spell out the responsibilities and

authorities between the MWRA and DEP, as well as determining reduction standards.

Currently there are four staff positions for the I/I Management Program.

2.1 Determination of Excessive I/I

The MWRA will implement various projects and programs to quantify and locate sources of I/I. These include:

- A sewer system metering project to isolate flow from each community and determine its flow components.
- An I/I Management Project which will review all I/I studies performed in each community and provide recommendations for specific I/I reduction measures and removal goals for each community.
- In-line television inspections of MWRA interceptors to identify physical defects, illegal connections and other sources of excessive I/I.
- An Engineering Assistance Program which will assist the member communities to implement the required I/I engineering studies and to comply with DEP regulations.
- A Technical Assistance Program whereby MWRA will be available to assist communities in developing proper sewer maintenance programs.

2.2 Management and Control of Excessive I/I

The MWRA will implement various programs to manage and control excessive I/I. These include:

- An I/I Management Program, including preventive maintenance within the MWRA sewer system, monitoring within local systems to support programs to reduce local I/I flow; and enforcement through the Municipal Permit Program.
- A Public Education Program to educate ratepayers as to the importance of implementing I/I reduction in their communities.
- An Economic Incentive Program. Develop system of charges which bases a community's cost for wastewater treatment services on the community's actual contribution of sewage, including I/I.

3.0 Toxic Reduction and Control Program

The Toxic Reduction and Control Program (TRAC) is a multi-faceted program designed to minimize and control the inflow of hazardous or toxic materials and heavy metals into the MWRA sewer system. Reducing the introduction of hazardous materials into the sewer system is an essential component of the effort to end the pollution of Boston Harbor and will also improve the quality and marketability of MWRA sludge.

3.1 Industrial Pretreatment Program

The Industrial Pretreatment Program includes inspecting, monitoring and permitting approximately 1,500 industries located within the MWRA's sewer service area (43 communities including the City of Boston), and all necessary enforcement actions to ensure compliance with all applicable State, Federal and MWRA sewer use regulations.

Inspection Activities

Initial inspections of all known industries within the MWRA sewer service area have been conducted to date. Follow-up inspections, including routine and special inspections, are performed on many of the industries initially inspected. In FY89, 865 industrial inspections were conducted.

The purpose of inspections is to ascertain the nature of the activity performed at the facility, the raw materials used, products and services produced, and the unit processes and operations employed; recommend sampling of wastes if necessary; ensure that the facility has a discharge permit or that a permit application has been completed. Permit information, such as location of discharge points and quantity of wastes discharged, can be verified during an inspection. Inspections can also identify sources of inflow, such as non-contact cooling water, and excessive uses of water.

Monitoring Activities

This aspect of the program includes monitoring of contaminants in industrial waste discharges, NPDES permit monitoring, treatment plant and CSO sampling, soil sampling, beach sampling, and verifications of industrial discharges and connections. Monitoring provides the basis for enforcement to eliminate unacceptable concentrations of toxics and other harmful substances. Monitoring is done to ensure compliance with permit conditions, and to identify substances in the sewer system which may

cause problems at the treatment plants or violation of a NPDES permit condition. In FY89, TRAC conducted over 2,100 monitoring visits.

Permitting: Municipal and Sewer Use Discharge Permits

Municipal Discharge Permits are issued to each of the 43 member communities on a yearly basis. The permits regulate all discharges, septage disposal sites, and direct connections to the MWRA's sewer system located in each municipality.

Sewer Use Discharge Permits are issued to each sewer user discharging industrial wastes to the Authority sewer system regardless of size, type or volume of discharge. Permits are issued to three categories of sewer users. The issuance of the Sewer Use Discharge Permit does not necessarily mean the industry is discharging an acceptable waste. The permit could contain specific corrective remedial conditions as set forth by the Authority that the industry must meet within a designated time frame. Also, the permit could clearly establish discharge violations in support of anticipated enforcement actions.

Compliance and Enforcement

The inspection, monitoring and permit activities provide the information necessary to determine initially whether any enforcement actions are required. Enforcement actions range from informal meetings with the offending company to legal action. Actions can result in civil penalties and agreements for judgments mandating adherence to strict compliance schedules.

In December 1988 TRAC assessed the largest single penalty in MWRA's history, \$682,250. In FY89 TRAC assessed over \$1.6 million in penalties against violators of MWRA regulations.

TRAC has assessed \$697,600 in penalties to date in FY90. This effort was part of an aggressive campaign to stop industrial pollution by increased enforcement. To carry out this effort, TRAC hired legal staff and additional compliance personnel. In addition, an Enforcement Task Force was created to assist in enforcement efforts. The Task Force reviewed cases and made enforcement recommendations. Two cases were referred to the Attorney General's Office for consideration. One of the cases was presented to the grand jury for consideration and an indictment was returned in FY90. The other case is still pending.

Other elements of the TRAC program include:

3.2 Landfill Leachate Monitoring

Certain current regulations allow that sanitary landfill leachate be discharged into local sewer systems if the leachate meets certain quality criteria. The TRAC program includes an effort to periodically sample leachate from landfills to identify the type and concentration of any toxic constituents and to develop appropriate pretreatment programs and compliance measures. Landfill monitoring is increasingly a concern for TRAC. Several permit applications requesting landfill connections to the MWRA system were received in FY89. These permits were issued during FY90. TRAC plans to monitor and analyze the actual and potential impact of landfill discharges into the MWRA sewer system.

3.3 Septage Control

This program is intended to reduce the input of pollutants to the MWRA sewerage system from septage disposal sites through increased inspection and monitoring activities. These activities consist of overseeing municipal septage sites to ensure that MWRA regulations are being met and that illegal dumping does not occur.

In addition to reducing the volume of toxic waste entering the MWRA system, these activities will help to lower the overall cost of sewerage service to member communities by excluding septage received from non-MWRA communities.

As part of the MWRA permit process, municipalities are required to oversee their individual septage facilities. TRAC increased monitoring and enforcement at municipal septage sites during 1989. Over 550 septage inspections were conducted. In FY89 a Septage Management Study was initiated to determine whether and to what extent municipal septage facilities are adequate and what role, if any, the MWRA should have in septage management.

3.4 Oil/Gas Protection Program

An assessment was made of the contributions from petroleum into the MWRA sewer system during the year. The results of the assessment are still preliminary; however, they do point to the need for further investigation of petroleum contamination in groundwater and petroleum pollution from industry. These investigations are presently underway. Significantly, during FY89 over 1,700 inspections of various types of petroleum facilities were undertaken.

3.5 Source Reduction, Household Hazardous Waste, and Urban Runoff

Development began on additional programs to complement the pretreatment program by focusing on pollution prevention before it reaches the MWRA system during the last two years. These programs focus on household hazardous waste, urban runoff, and source reduction (for industries).

L. Status of On-Island Residuals Treatment

The Secretary's Certificate requested additional clarification of the potential residuals facilities to be sited on Deer Island. In February 1989, the Authority formally announced, in its Draft Residuals Management Facilities Plan (RMFP), that only sludge digestion and appurtenant processes would take place on Deer Island. The design process for the Deer Island residuals facilities began in June 1989, and will be completed for primary sludge and the accelerated portion of secondary sludge in September 1990. Long-term residuals processing activities to be located on Deer Island include: gravity thickening of waste activated sludge, digestion of combined sludges, digester gas collection, odor/air quality control, and pumping of sludge to the Fore River Staging Area for pelletizing. Interim residuals facilities on Deer Island include sludge storage and barge loading facilities to fill barges used to transport sludge to the Fore River Staging Area for pelletizing. Both interim and long-term residuals management are the subjects of separate environmental impact reports.

M. Accelerated Construction

The Secretary's Certificate requests that the water quality impacts of an accelerated construction schedule be addressed, in addition to the secondary noise and traffic impacts of such a plan. Effects of accelerated construction on interim residuals processing also need to be addressed.

MWRA, as instructed by federal court order, developed an accelerated schedule for the construction of the Deer Island Secondary Treatment Facilities. Upon completion and examination of accelerated schedule options, the MWRA Board of Directors decided to proceed with an accelerated construction schedule. The accelerated schedule, described as Alternate Plan A in the Secondary Treatment Facilities Plan, provides for the concurrent construction of primary and some part of the secondary treatment facilities. This results in the opportunity to provide primary treatment for 100% of the flow in 1995 as planned and secondary treatment for 20% of the flow in 1996, with 100% secondary treatment in 1999. This option provides an advantage over the original base plan which would provide primary treatment in 1995, but no secondary treatment until 1999.

Implementation of the accelerated construction plan requires that several concurrent activities be carried out. Existing primary treatment facilities must remain in operation during construction of the new secondary treatment facilities while modifications to the existing plant take place. Residuals facilities must be able to handle roughly 30% greater volume (over the original plan) of sludge produced in 1995 by the alternative plan.

The Deer Island House of Correction must be decommissioned by 1991 to allow its demolition by 1992.

MWRA has determined that all of these considerations can be met. Engineering investigations have concluded that difficulties in maintaining existing primary treatment operations can be overcome. Operation of planned interim residuals processing beyond 1995 in conjunction with long term pelletizing facilities will provide the additional residuals handling capacity required. Legislation to provide for an accelerated design-build process for a new prison has been approved by the State Legislature and provides for decommissioning of the House of Corrections by the end of 1991. Movement of the prison is also mandated by federal court order.

Construction impact changes resulting from the accelerated schedule are minimal. The potential exists for an increase of approximately 260 workers more than base plan for the period 1993-1994 resulting in an acceptable increase in traffic which does not exceed peak estimates reported for the base plan. The overall worker peak, which occurs in 1992, is unaffected by the accelerated plan.

Providing partial secondary treatment at an early date offers significant environmental benefit, with enhanced levels of removal for organic materials, solids, and toxics. Providing some secondary effluent will provide a better effluent quality for discharge through the new outfall, alleviating some concerns raised regarding the outfall siting. Early use of secondary treatment does have the consequence of increased toxics levels in residuals at an early date. Investigations by the MWRA residuals program and contractors have indicated that several options exist for handling the increased residuals volume and quality changes through the interim residuals program.

MWRA is committed to following the accelerated schedule described and to exploring reasonable and attainable schedule enhancements which lead to environmental benefit and decreased costs without sacrificing mitigation plans or plant reliability. Milestones based upon this schedule have been agreed to by the Federal Court. The MWRA is following the accelerated plan and has developed a critical path schedule which reflects the accelerated plan.

N. Commitments on Hazardous Materials and Waste Disposal

The Secretary's Certificate states that hazardous materials and any proposals for remediation of contamination must be addressed. Preliminary investigations of Deer Island and supporting water transportation facilities sites indicates the potential for hazardous materials to be present. Materials on Deer Island include asbestos in existing structures and areas of soil contaminated with petroleum products. Materials at the water transportation facilities include asbestos in existing structures and potential petroleum spills. MWRA has performed or is in the process of performing 21E type investigations of all

of these sites. Investigations include comprehensive sampling programs developed with and approved by the Massachusetts DEP.

The current status of the Deer Island investigation is that all historic research has been performed and phase two (Massachusetts Contingency Plan) is complete. Immediate remedial action required on Deer Island is being undertaken as part of the Early Site Preparation construction phase prior to major earth-moving and demolition efforts. Additional investigation and planning is underway to develop an island-wide remediation. Investigations at other sites are largely complete and remediation plans are being developed.

MWRA is committed to removing or controlling and proper disposal of all hazardous materials encountered in the construction of the Deer Island Secondary Treatment Facilities and supporting facilities. MWRA seeks to protect its workers, contractors' personnel, and the public from hazardous materials encountered during the treatment facilities project.

Disposal of existing non-hazardous wastes currently located on Deer Island will largely be handled as part of the Early Site Preparation construction phase. There are three types of waste to be disposed of: grit and screenings, non-biodegradable demolition materials and construction wastes.

Grit and screenings consist of materials which have been removed from the sewage flow and landfilled on Deer Island over the last twenty or so years. This material will be moved to clear areas which must be regraded for future construction. MWRA will place the material in a secure landfill constructed in the southern landform on Deer Island. This landfill will be solely for the existing grit and screening on the Island, with the possible addition of a limited quantity of fixed scum. The landfill has been designed and permitted according to DEP standards.

Non-biodegradable demolition materials consist of concrete, reinforced concrete, stone, and asphalt pavement which originates from existing structures and roads on Deer Island. Approval has been granted to MWRA from DEP/DSWM to incorporate this material in the large landform to be constructed as a barrier on the northern portion of Deer Island.

Organic demolition and construction wastes consist primarily of wood, plaster, and other building and packing materials. These wastes will be barged from Deer Island for disposal at licensed landfills.

MWRA is committed to disposing of wastes in an environmentally sound fashion and to utilize, wherever feasible, disposal on-site to minimize cost and transportation impacts, and to avoid filling valuable landfill space elsewhere whenever possible.

O. Utility Supply

DEP raised several questions regarding the Authority's plans for power supply to the wastewater treatment facility, primarily in the areas of timing of various power supply installations, permitting of new sources, and technical questions regarding power supply sizing and emissions. These questions and the Authority's responses were included in the Appendix attached to the earlier draft of these Findings.

An additional volume covering the utilities for Deer Island facilities (Supplement to Appendix H, Volume III, Off Island Utility Supply) has undergone public review. Comments on this volume have been responded to in a separate document.

IV. Summary of Impacts and Findings of Limitations of Impacts

The MWRA finds that the environmental impacts resulting from the construction of the Boston Harbor wastewater treatment facility are those impacts as described in Draft Environmental Impact Report, Secondary Treatment Facilities Plan, elaborated on and refined in the Final Environmental Impact Report and commented upon in these G.L.C 30, Section 61 Findings.

The MWRA further finds that its planning and environmental review for the wastewater treatment facilities on Deer Island, and its commitment to the mitigation measures set out in the Commitments to Mitigation section of these G.L.C 30, Section 61 Findings constitute all feasible measures to avoid or minimize the environmental impacts described.

Realizing the complexity of the proposed wastewater treatment facilities, and that technological changes are likely to take place during the decade of design and construction, MWRA commits to inform the Massachusetts Environmental Policy Act Unit (MEPA) of inevitable significant changes in the project as they occur.

